Exhibit 1

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Paper 11
Date: August 18, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NOKIA OF AMERICA CORPORATION,
Petitioner,

v.

TQ DELTA, LLC,
Patent Owner.

IPR2022-00471
Patent 8,462,835 B2

Before JONI Y. CHANG, JENNIFER MEYER CHAGNON, and ROBERT J. WEINSCHENK, *Administrative Patent Judges*.

CHANG, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Nokia of America Corporation ("Petitioner" or "Nokia") filed a Petition requesting an *inter partes* review ("IPR") of claims 8−10, 15, 24−26, and 31 ("the challenged claims") of U.S. Patent No. 8,462,835 B2 (Ex. 1001, "the '835 patent"). Paper 2 ("Pet."), 1. TQ Delta, LLC ("Patent Owner") filed a Preliminary Response (Paper 6, "Prelim. Resp."). Pursuant to our authorization, Petitioner filed a Reply (Paper 7, "Reply"), and Patent Owner filed a Sur-reply (Paper 8, "Sur-reply").

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the petition "shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." For the reasons stated below, we determine that Petitioner has established a reasonable likelihood that it would prevail with respect to at least one claim. We hereby institute an *inter partes* review as to all of the challenged claims of the '835 patent and all of the asserted grounds of unpatentability.

A. Related Matters

The parties indicate that the '835 patent is involved in the following proceedings: *TQ Delta, LLC v. 2Wire, Inc.*, Case No. 1:13-cv-01835 (D. Del.), filed November 4, 2013 (the "Delaware case"); *TQ Delta, LLC v. ADTRAN, Inc.*, Case No. 1:14-cv-00954 (D. Del.), filed July 17, 2014; *ADTRAN, Inc. v. TQ Delta, LLC*, Case No. 1:15-cv-00121 (D. Del.), filed July 17, 2014 (transferred from Alabama Northern on February 3, 2015); and *TQ Delta, LLC v. CommScope Holding Co.*, Case No. 2:21-cv-00310

(E.D. Tex.), filed August 13, 2021 (the "Texas case"). Pet. 69−70; Paper 3, 2−3; *see also* Ex. 2009 (District Court Consolidation Order) (consolidated the Nokia case[1] into the Texas case).

The '835 patent is also involved in *CommScope Inc. v. TQ Delta, LLC*, IPR2021-00352 (PTAB, filed Dec. 31, 2021).

B. The '835 Patent

The '835 patent is related to impulse noise management in communication systems. Ex. 1001, code (54), 1:20−25. According to the '835 patent, communication systems often operate in environments that produce impulse noise, which is a short-term burst of noise that is higher than the normal noise that typically exists in a communication channel. *Id.* at 1:27−30. For example, digital subscriber line ("DSL") systems operate on telephone lines and experience impulse noise from many external sources. *Id.* at 1:30−32. It is standard practice for communication systems to use interleaving in combination with forward error correction ("FEC") to correct the errors caused by impulse noise. *Id.* at 1:34−37. Standard initialization procedures in asymmetrical digital subscriber line ("ADSL") and very-high-bit-rate digital subscriber line ("VDSL") systems are designed to optimize performance in the presence of "stationary" crosstalk or noise. *Id.* at 1:37−40. Impulse noise protection is handled with interleaving and FEC.

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[1] TQ Delta sued Nokia on various patents in *TQ Delta, LLC v. Nokia Corp.*, Case No. 2:21-cv-00309 (E.D. Tex.), filed August 13, 2021 (the "Nokia case"). The '835 patent is not asserted in the Nokia case.

Id. at 1:40−41. Impulse noise protection ("INP") is defined in the ADSL2 Standard G.992.3, as the number of impulse noise corrupted discrete multitone transceiver ("DMT") symbols that can be corrected by the FEC and interleaving configuration. *Id.* at 1:65−2:2. Specifically, G.992.3 defines the following variables:

> INP=1/2*(S*D)*R/N;
> S=8*N/L;
> Latency (or delay)=S*D/4; and
> Line Rate (in kbps)=L*4,

where N is the codeword size in bytes, R is the number of parity (or redundancy) bytes in a codeword, D is the interleaver depth in number of codewords, and L is the number of bits in a DMT symbol. *Id.* at 2:2−15. If K is the number of information bytes in a codeword then N=K+R and the user data rate is approximately equal to: L*4*K/N. *Id.* at 2:16−21. In general, DSL systems (such as the one defined in ADSL G.992.x or VDSL G.993.x) use the FEC and interleaving parameters ("FIP") characterized by the set of parameters (N, K, R, D). *Id.* at 2:22−25.

The '835 patent discloses that a communication system adapts the impulse noise parameters on-line by operating using a series of different FIP settings. *Id.* at 8:21−23. For each FIP setting, the system can determine dynamically if the appropriate amount of impulse noise protection is being provided. *Id.* at 8:23−25. Based on these determinations, the system can select a particular FIP setting for regular (i.e., Showtime) operation. *Id.* at 8:25−27. This impulse noise protection adaptation can be performed during Showtime and/or during initialization. *Id.* at 8:28−30.

The '835 patent also discloses that the receiver and transmitter can synchronize the modification of the FIP parameters such that both the transmitter and receiver start using the parameters at the same instant in time. *Id.* at 11:4−7. This synchronization can be based on a synchronization using FEC codeword counters or a flag signal. *Id.* at 11:7−9.

For the flag signal embodiment, the '835 patent discloses that receiving modem 200 and transmitting modem 300, in cooperation with synchronization module 280 and synchronization module 320, "synchronize the change in FIP settings using a flag or marker signal that is similar to that used in the ADSL2 G.992.3 ORL protocol." *Id.* at 11:66−12:5. Additionally, "the receiver and transmitter would start using updated FEC and interleaving parameters on a pre-defined FEC codeword boundary following the sync flag." *Id.* at 12:8−11. For example, while transmitting using a first INP setting, a determination is made that a new FIP setting is needed due to the presence of impulse noise in the line. *Id.* at 12:11−14. Receiving modem sends a message to transmitting modem indicating the new FIP settings to be used for transmission and reception. *Id.* at 12:17−20. Transmitting modem then sends a flag or marker signal to receiving modem indicating the new FIP settings are to be used on a predetermined number of DMT symbols following the transmission of the flag or marker signal. *Id.* at 12:25−29. "For example, the flag signal could be an inverted sync symbol, or syn FLAG, as used in the ADSL2 G.992.3 OLR protocol." *Id.* at 12:29−31. Transmitting modem and receiving modem then start using the new FIP settings for transmission on the predetermined number of DMT

symbols following the transmission of the flag or market signal. *Id.* at 12:31−34.

C. Illustrative Claims

Of the challenged claims, claims 8 and 24 are independent. Claims 9, 10 and 15 depend from claim 8, and claims 25, 26 and 31 depend from claim 24. Claims 8 and 24 are illustrative:

> 8. An apparatus configurable to adapt forward error correction and interleaver parameter (FIP) settings during steady-state communication or initialization comprising:
> [8.a] a transceiver, including a processor, configurable to:
> [8.b] transmit a signal using a first FIP setting,
> [8.c] transmit a *flag signal*, and
> [8.d] switch to using for transmission, a second FIP setting following transmission of the flag signal,
> wherein:
> [8.e] the first FIP setting comprises at least one first FIP value,
> [8.f] the second FIP setting comprises at least one second FIP value, different than the first FIP value, and
> [8.g] *the switching occurs on a pre-defined forward error correction codeword boundary following the flag signal*.

Ex. 1001, 21:33–46 (emphases added).

> 24. An apparatus configurable to adapt forward error correction and interleaver parameter (FIP) settings during steady-state communication or initialization comprising:
> [24.a] a transceiver, including a processor, configurable to:
> [24.b] receive a signal using a first FIP setting,
> [24.c] receive a *flag signal*, and
> [24.d] switch to using for reception, a second FIP setting following reception of the flag signal,
> wherein:
> [24.e] the first FIP setting comprises at least one first FIP value,

> [24.f] the second FIP setting comprises at least one second FIP value, different than the first FIP value, and
> [24.g] *the switching occurs on a pre-defined forward error correction codeword boundary following the flag signal*.

Ex. 1001, 21:33–46 (emphases added).

D. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 10)[2]:

Claims Challenged	**35 U.S.C. §**	**References**
8−10, 15, 24−26, 31	102(b)	G.992.1[3]
8−10, 15, 24−26, 31	103(a)	SC-060[4]
8−10, 15, 24−26, 31	103(a)	G.992.1, SC-060
8−10, 15, 24−26, 31	103(a)	G.992.1, Wunsch[5]

[2] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. §§ 102 and 103, effective March 16, 2013. Because the '835 patent was filed before this date, we refer to the pre-AIA versions of §§ 102 and 103. Ex. 1001, code (22).

[3] International Telecommunication Union, Telecommunication Standardization Sector ("ITU-T") Recommendation G.992.1 (1999) (Ex. 1004, "G.992.1").

[4] ITU-T SG15/Q4 Contribution SC-060 (Ex. 1005, "SC-060").

[5] Wunsch, U.S. Patent Application Publication No. 2002/0172188 (Ex. 1006).

II. ANALYSIS

A. Whether the Petition is Time-Barred under § 315(b)

The Petition identifies Nokia Corporation, Nokia Solutions and Networks Oy, and Petitioner (Nokia of America Corporation) as the real parties in interest ("RPI"). Pet. 67. The Petition also states that there are no privities relevant to this Petition. *Id.*

Patent Owner argues that the Petition is barred under § 315(b) because 2Wire, Inc. ("2Wire") and CommScope, Inc. ("CommScope") are RPIs and privies of Petitioner. Prelim. Resp. 9−25. Patent Owner contends that it "sued 2Wire for infringement of the 835 Patent almost eight years ago," and that it "sued CommScope for infringement of the 835 Patent in August 2021." *Id.* at 15−16. Patent Owner admits that it "has not sued Nokia for infringement of the 835 Patent." *Id.* at 16. According to Patent Owner, "2Wire and CommScope would both benefit from the Board instituting Nokia's Petition and finding that the Challenged Claims (which encompass the claims asserted against 2Wire and CommScope) are unpatentable," and "2Wire and CommScope desire institution of Nokia's Petition." *Id.*

For the reasons stated below, we find that neither 2Wire nor CommScope is an RPI or a privy of Petitioner, and therefore, the Petition is not time barred under § 315(b).

1. Background

Patent Owner filed a lawsuit in the District of Delaware, which was amended on February 7, 2014, to name 2Wire as a defendant for infringing

claims 8 and 10 of the '835 patent. Ex. 2002 (Second Amended Complaint in the Delaware case). On June 28, 2021, the Delaware court issued a summary judgment opinion finding that 2Wire infringes claims 8 and 10 of the '835 patent. Ex. 2011 (Memorandum Opinion in the Delaware case).

On August 13, 2021, Patent Owner filed a separate lawsuit against CommScope, CommScope Holding Company, and several ARRIS subsidiaries alleging infringement of claims 8, 10, 24, and 16 of the '835 patent in the Eastern District of Texas. Ex. 1028 (Complaint against CommScope). Patent Owner also sued Nokia, in another separate lawsuit filed in the Eastern District of Texas, for infringing several of Patent Owner's patents, but not for infringing the claims of the '835 patent. Ex. 1033 (Complaint against Nokia); Prelim. Resp. 14. On October 22, 2021, the District Court ordered the CommScope and Nokia cases to be consolidated into the Texas case (Case No. 2:21-cv-00310). Ex. 2009 (Consolidated Order).

On December 31, 2021, CommScope filed a Petition in IPR2022-00352, challenging claims 8−10, 15, 24−26, and 31 of the '835 patent. *CommScope*, IPR2022-00352, Paper 2. On January 21, 2022, Nokia filed the instant Petition, challenging the same claims of the '835 patent, based on the same grounds, as those in IPR2022-00352. Pet. 1.

2. Principles of Law

Section 315(b) of Title 35 of the United States Code provides:

> (b) PATENT OWNER'S ACTION.—An inter partes review may not be instituted if the petition requesting the proceeding is

> filed more than 1 year after the date on which the petitioner, real party in interest, or privy of the petitioner is served with a complaint alleging infringement of the patent. The time limitation set forth in the preceding sentence shall not apply to a request for joinder under subsection (c).

"Whether a party who is not a named participant in a given proceeding nonetheless constitutes a 'real party-in-interest' . . . to that proceeding is a highly fact-dependent question" with no "bright line test," and is assessed "on a case-by-case basis." *See* Consolidated Trial Practice Guide ("Consolidated Practice Guide")[6] at 12 (citing *Taylor v. Sturgell*, 553 U.S. 880, 893−95 (2008); 18A Charles Alan Wright, Arthur R. Miller & Edward H. Cooper, Federal Practice & Procedure §§ 4449, 4451). "To decide whether a party other than the petitioner is the real party in interest, the Board seeks to determine whether some party other than the petitioner is the 'party or parties *at whose behest the petition has been filed*.'" *Wi-Fi One, LLC v. Broadcom Corp.*, 887 F.3d 1329, 1336 (Fed. Cir. 2018) (emphasis added). "A party that funds and directs and controls an IPR or post-grant review proceeding constitutes a 'real party-in-interest,' even if that party is not a 'privy' of the petitioner." *Id*. Also, several relevant factors for determining whether a party is an RPI include the party's relationship with the petitioner, the party's relationship to the petition, and the nature of the entity filing the petition. Consolidated Practice Guide at

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[6] Available at https://www.uspto.gov/TrialPracticeGuideConsolidated; *see also* 84 Fed. Reg. 64,280 (Nov. 21, 2019).

17−18; *Applications in Internet Time, LLC v. RPX Corp.*, 897 F.3d 1336, 1351 (Fed. Cir. 2018) ("*AIT*").

The concept of "privity" is more expansive and encompasses parties that do not necessarily need to be identified in the petition as RPIs. Consolidated Practice Guide at 14. The legislative history endorsed the expression of "privy" as follows:

> The word "privy" has acquired an expanded meaning. The courts, in the interest of justice and to prevent expensive litigation, are striving to give effect to judgments by extending "privies" beyond the classical description. *The emphasis is not on the concept of identity of parties, but on the practical situation. Privity is essentially a shorthand statement that collateral estoppel* is to be applied in a given case; there is no universally applicable definition of privity. *The concept refers to a relationship between the party to be estopped and the unsuccessful party in the prior litigation which is sufficiently close so as to justify application of the doctrine of collateral estoppel*.

154 CONG. REC. S9987 (daily ed. Sept. 27, 2008) (statement of Sen. Kyl) (emphasis added); 157 CONG. REC. S1376 (daily ed. Mar. 8, 2011) (incorporating prior 2008 statement). "[T]he standards for the privity inquiry must be grounded in due process." *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1318−19 (Fed. Cir. 2018). "[T]he privity inquiry in this context naturally focuses on *the relationship* between the named IPR petitioner and the party *in the prior lawsuit*. For example, it is important to determine whether the petitioner and the prior litigant's relationship—as it relates to the lawsuit—is sufficiently close that it can be

fairly said that the petitioner had a full and fair opportunity to litigate the validity of the patent in that lawsuit." *Id*. (emphases added).

In *Taylor*, the United States Supreme Court identified a non-exhaustive list of six categories under which nonparty preclusion based on a privity relationship may be found: (1) an agreement between the parties to be bound; (2) pre-existing substantive legal relationships between the parties; (3) adequate representation by the named party; (4) the nonparty's control of the prior litigation; (5) where the nonparty acts as a proxy for the named party to re-litigate the same issues; and (6) where special statutory schemes foreclose successive litigation by the nonparty (e.g., bankruptcy or probate). *Taylor*, 553 U.S. at 893−95, 893 n.6. The Supreme Court noted that this list of the six "established grounds for nonparty preclusion" is "meant only to provide a framework . . . , not to establish a definitive taxonomy." *Id*. at 893 n.6.

Petitioner "bears the ultimate burden of persuasion to show that its petitions are not time-barred under § 315(b) based on a complaint served on an alleged real party in interest more than a year earlier." *Worlds Inc. v. Bungie, Inc.*, 903 F.3d 1237, 1242 (Fed. Cir. 2018).

3. RPI Analysis

Patent Owner argues that 2Wire and CommScope are "clear beneficiar[ies]" of the Petition and have "a preexisting, established relationship with" Nokia. Prelim. Resp. 15−22 (quoting *AIT*, 897 F.3d at 1351). According to Patent Owner, "2Wire and CommScope would both benefit from the Board instituting Nokia's Petition and finding that the

Challenged Claims (which encompass the claims asserted against 2Wire and CommScope) are unpatentable." *Id.* at 16. Patent Owner also argues that "the facts that Nokia and CommScope are co-defendants in the Texas Litigation and that Nokia filed a Petition to challenge the ['']835 Patent when the ['']835 Patent has not been asserted against Nokia indicate that Nokia has a preexisting established relationship with CommScope and 2Wire." *Id.* at 17. Patent Owner contends that "it is apparent that Nokia and CommScope have an agreement to divvy up challenging [Patent Owner's] patents via IPR to each other's benefit." *Id.*; Sur-reply 1−7.

On this record, we find Petitioner has shown sufficiently that neither 2Wire nor CommScope is an RPI. We have considered Patent Owner's arguments, but find them unavailing. Patent Owner narrowly focuses on why either 2Wire or CommScope would benefit from having the challenged claims invalidated.

As the Board has explained, "[a] careful reading of *AIT* makes clear . . . that mere benefit is not the standard for determining whether a party is an RPI" and "a focus on mere benefit alone would make virtually any entity that would plausibly incur the expense of filing a petition for *inter partes* review an RPI in the first-filed *inter partes* review." *Bowtech, Inc. v. MCP IP, LLC*, IPR2019-00379, Paper 14 at 23 (PTAB July 3, 2019) (Decision on Institution); *see also RPX Corp. v. Applications in Internet Time, LLC*, IPR2025-01750, Paper 128 at 30–31 (PTAB Oct. 2, 2020) (precedential) (noting that the facts of a pre-existing relationship and a benefit to the alleged RPI are not sufficient to require a finding that the alleged RPI is an

RPI). Notably, a focus on mere benefit would incorrectly make every entity, who has been sued for infringement of the involved patent, an RPI.

The Federal Circuit in *AIT* explained that

> Determining whether a non-party is a "real party in interest" demands a flexible approach that takes into account both equitable and practical considerations, with an eye toward determining whether the non-party is a clear beneficiary that has a preexisting, established relationship with the petitioner. Indeed, the Trial Practice Guide, on which the Board relied, suggests that the agency understands the "fact-dependent" nature of this inquiry, explaining that the two questions lying at its heart are whether a non-party "desires review of the patent" and whether a petition has been filed at a nonparty's "behest."

AIT, 897 F.3d at 1351 (quoting the Office Trial Practice Guide, 77 Fed. Reg. 48,756, 48,759 (Aug. 14, 2012)[7]).

Here, Petitioner has its own interest in filing this Petition because Patent Owner has threatened Petitioner with litigation of its patents, including the '835 patent. Specifically, the evidence of record indicates that Patent Owner has previously sent a table and/or claim charts to Petitioner alleging infringement of numerous patents, including the '835 patent. Ex. 1034, 59; Ex. 1035; Ex. 1036; Ex. 1038 ¶ 3. Petitioner asserts, and Patent Owner does not dispute, that "TQ Delta continues to insist that Nokia take a license to *all* of its patents, including every patent that Nokia has petitioned for IPR." Reply 2–3. Petitioner explains that its IPRs challenged only "patents that either have been asserted against it in the E.D. Texas

[7] The quoted language also appears in the Consolidated Practice Guide at 14.

litigation and/or that have been previously identified in [Patent Owner's] litigation threats." Reply, 2−3; Ex. 1038 ¶ 3.

In addition, Mr. Scott Stevens, Petitioner's counsel, testifies that "Nokia's decision to file its petition was independently made and not at the behest or request of 2Wire or CommScope." Ex. 1038 ¶ 4. Mr. Stevens also testifies that "Nokia has not engaged in any type of agreement or arrangement with 2Wire and/or CommScope regarding the substance of any petition, divvying up patents, or making decisions regarding the filed IPRs." *Id.* ¶ 5. Mr. Stevens further testifies that "2Wire and CommScope have had no control over Nokia's decisions regarding the petitions for IPR it has filed, and 2Wire and CommScope did not provide input or consultation on Nokia's decisions." *Id.* ¶ 7. Moreover, Mr. Stevens testifies that "Nokia did not file the '835 Petition at the behest of 2Wire or CommScope," and that "[n]either CommScope nor 2Wire funded, directed, controlled, or were in any way involved in the petitions for IPR filed by Nokia." *Id.* ¶¶ 9, 10.

Thus, even if Petitioner's interests and the interests of 2Wire or CommScope in the litigation generally are aligned in that they have been threatened or charged with infringing the same patents (as would normally be true for co-defendants), the evidence of record shows that Petitioner acted independently and Petitioner did not file the Petition at the behest or on behalf of 2Wire or CommScope. *See Wi-Fi Remand*, 887 F.3d at 1340–41 ("Wi-Fi's evidence showed that Broadcom's interests as to the issue of infringement were generally aligned with those of its customers," but "there

is no evidentiary support for Wi-Fi's theory that Broadcom was acting at the behest or on behalf of the D-Link defendants.").

4. Privity Analysis

Patent Owner argues that 2Wire and CommScope are privies of Petitioner. Prelim. Resp. 22−25; Sur-reply 1−7. Patent Owner contends multiple *Taylor* considerations support a finding of privity. Prelim. Resp. 22−25. In particular, for the second and fifth *Taylor* categories, Patent Owner argues that "there was a preexisting substantive legal relationship between CommScope/2Wire and Nokia," and that "Nokia acted as a proxy for 2Wire and CommScope by filing its Petition." *Id.* at 23−24. Patent Owner contends that, because 2Wire is a subsidiary of CommScope, and CommScope and Nokia are co-defendants, "CommScope and Nokia have worked together to divvy up IPR filings for TQ Delta patents so that an IPR petition filed by one party benefits the other." *Id.*

However, as discussed above, the Federal Circuit has made clear in *WesternGeco* that "a common desire among multiple parties to see a patent invalidated, without more, does not establish privity." *WesternGeco*, 889 F.3d at 1321. Moreover, Mr. Stevens testifies that "Nokia has not engaged in any type of agreement or arrangement with 2Wire and/or CommScope regarding the substance of any petition, divvying up patents, or making decisions regarding the filed IPRs." Ex. 1038 ¶ 5. Therefore, we do not find that either 2Wire or CommScope is a privy of Petitioner under the second and fifth *Taylor* categories.

As to the third *Taylor* category, Patent Owner argues that "Nokia's interests have been adequately represented in the 2Wire Lawsuit." Prelim. Resp. 23−24. According to Patent Owner, "2Wire's interest in the 2Wire Lawsuit (i.e., invalidating the 835 Patent) coincides with Nokia's interest in this proceeding." *Id.* Patent Owner also avers that "Nokia must believe its interest have been well represented in the 2Wire Lawsuit because it used the same technical expert that 2Wire used in the 2Wire Lawsuit." *Id.*

Patent Owner's arguments are based on speculation. Using the same technical expert to support the Petition challenging a patent in a specialized technical field does not equate to having Nokia's interest represented in the Delaware case. The Delaware case involves only two claims of the '835 patent, whereas this IPR involves 8 claims of the '835 patent. Moreover, Mr. Steven testifies that "Nokia did not and does not have any control over the 2Wire litigation." Ex. 1038 ¶ 6. Therefore, Nokia's interests have not been adequately represented in the Delaware case, as Patent Owner alleges. On this record, we find that neither 2Wire nor CommScope is a privy of Petitioner under the third *Taylor* category.

As to the sixth *Taylor* category, Patent Owner argues that § 315(b) is a special statutory scheme as identified in *Taylor* because it serves to prevent successive challenges to a patent. Prelim. Resp. 24−25. Patent Owner's argument is misplaced. As noted above, § 315(b) provides Petitioner a one-year time period to file a petition after being served with a complaint alleging infringement of the patent. The legislative history indicates that § 315(b) was intended to set a "deadline for allowing an accused infringer to

seek *inter partes* review after he has been sued for infringement." 157 CONG. REC. S5429 (daily ed. Sept. 8, 2011) (statement of Sen. Kyl). The deadline helps to ensure that *inter partes* review is not used as a tool for harassment by "repeated litigation and administrative attacks." H.R. REP. NO. 112-98 at 48 (2011), *as reprinted in* 2011 U.S.C.C.A.N. 67, 78. "[T]he rationale behind § 315(b)'s preclusion provision is to prevent successive challenges to a patent by those who previously have had the opportunity to make such challenges in prior litigation." *WesternGeco*, 889 F.3d at 1319. Thus, the time-bar provision under § 315(b) does not constitute "a special statutory scheme expressly foreclosing successive litigation by nonlitigants" under the sixth *Taylor* consideration.

Here, Patent Owner has threatened Petitioner with litigation of its patents, including the '835 patent. Petitioner has timely filed its Petition under § 315(b). Nothing in this record shows that Petitioner uses this Petition as a tool for harassment by repeated litigation and administrative attacks. In sum, we find that neither 2Wire nor CommScope is a privy of Petitioner under the sixth *Taylor* category.

5. Conclusion as to the § 315(b) Issue

For the foregoing reasons, we determine that Petitioner has shown adequately that neither 2Wire nor CommScope is an RPI or a privy of Petitioner. We, therefore, conclude that Petitioner has demonstrated sufficiently that its Petition is not time-barred under § 315(b).

B. Discretionary Denial Under 35 U.S.C. § 314(a)

In its Preliminary Response, Patent Owner argues that we should exercise discretion to deny institution under § 314(a) in light of the Delaware case and the Texas case. Prelim. Resp. 25. Patent Owner contends that the factors identified in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) ("*Fintiv*"), weighs in favor of denying institution. *Id.*

On June 21, 2022, the Director of the U.S. Patent and Trademark Office ("USPTO") issued a Memorandum[8] titled "Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings With Parallel District Court Litigation" ("the Memorandum" or "Memo"), which states, among other things, that "to benefit the patent system and the public good, the PTAB will not rely on the *Fintiv* factors to discretionarily deny institution in view of parallel district court litigation where a petition presents compelling evidence of unpatentability." Memo, 2. The Memorandum explains that "compelling, meritorious challenges will be allowed to proceed at the PTAB even where district court litigation is proceeding in parallel." *Id.* at 4. "Compelling, meritorious challenges are those in which the evidence, if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence." *Id.* "[W]here the PTAB determines that the information presented at the institution stage

[8] Available at: https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf

presents a compelling unpatentability challenge, that determination alone demonstrates that the PTAB should not discretionarily deny institution under *Fintiv*." *Id.* at 4−5. "This clarification strikes a balance among the competing concerns of avoiding potentially conflicting outcomes, avoiding overburdening patent owners, and strengthening the patent system by eliminating patents that are not robust and reliable." *Id.* at 5. In addition, "[t]he compelling evidence test affirms the PTAB's current approach of declining to deny institution under *Fintiv* where the evidence of record so far in the case would plainly lead to a conclusion that one or more claims are unpatentable." *Id.* at 5 n.6 (citing, e.g., *Illumina Inc. v. Trs. Of Columbia Univ.*, IPR2020-00988, Paper 20 (PTAB Dec. 8, 2020) (declining to deny under *Fintiv* in light of strong evidence on the merits even though four factors weighed in favor of denial and remining factor was neutral)).

Here, we have considered the circumstances and facts before us in view of the *Fintiv* factors and the Memorandum. Based on the evidence in this current record, we determine that Petitioner's evidence for the anticipation ground based on G.992.1, if unrebutted at trial, would plainly lead to a conclusion that claims 8−10, 15, 24−26, and 31 are unpatentable by a preponderance of the evidence. *See infra* Section II.G. For this ground, Patent Owner disputes Petitioner's showing for the claimed "flag signal." Prelim. Resp. 35−41. We disagree with Patent Owner's arguments because they improperly rely on Patent Owner's proposed claim construction for "flag signal," which we decline to adopt for the reasons stated in our claim construction analysis in Section C below. *See infra* Section II.G. As

explained below, Petitioner's evidence plainly shows that G.992.1 discloses the claimed "flag signal" under the proper construction. *Id.* Based on the evidence in this record, we find that Petitioner presents compelling evidence of unpatentability as to the anticipation ground based on G.992.1. This determination alone demonstrates that we should not discretionarily deny institution in this proceeding under *Fintiv*.

C. Claim Construction

In an *inter partes* review, we construe a patent claim "using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b)." 37 C.F.R. § 42.100(b) (2021). Under this standard, the words of a claim generally are given their "ordinary and customary meaning," which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

In light of the parties' arguments and supporting evidence in this present record, we find that it is necessary to construe only the claim term "flag signal" for our determination of whether to institute a review. No other claim term requires express construction for purposes of our determination of whether to institute a review. *See Realtime Data LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent

necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

"flag signal"

Petitioner adopts the District Court's claim construction in the Delaware case for the term "flag signal," construing "flag signal" as "signal used to indicate when an update FIP setting is to be used (the signal does not include the FEC codeword counter value upon which the updated FIP setting is to be used)." Pet. 10−11 (citing Ex. 1024 (Claim Construction Order in the Delaware case)). Petitioner asserts that the District Court in the Texas case also adopted that construction. Reply 9−10; Ex. 1042 (Claim Construction Order in the Texas case), 87−91 (the Court adopts the District Delaware construction rather than the construction proposed by Plaintiff).

Patent Owner argues that the negative portion of the Delaware District Court's claim construction for the term "flag signal" is incomplete, and proposes to construe "flag signal" as "signal used to indicate when an updated FIP setting is to be used, *where the signal does not include information (e.g., a FEC codeword counter value) specifying when the updated FIP setting is to be used*," citing the Declaration of Vijay Madisetti, Ph.D., for support. Prelim. Resp. 6−9 (citing Ex. 2028 ¶¶ 25, 31−33, 36−37) (emphasis added). According to Patent Owner, the District Court's "construction leaves open the possibility that a message would qualify as a flag signal as long as it does not contain data indicating an FEC codeword counter value when, instead based on the claim term and intrinsic record, it should not." *Id.* at 8. Patent Owner avers that the '835 patent explains that

"a flag signal could be an inverted sync symbol, or sync FLAG, as used in the ADSL2 G.992.3 OLR protocol." *Id.* at 7 (citing Ex. 1001, 12:3−5, 12:29−31); *see also* Sur-reply 8−10. Patent Owner further argues that the Delaware District Court, Patent Owner, and "Petitioner (via its RPI and privy, 2Wire)," at the *Markman* hearing in the Delaware case, agreed that "a flag signal does not include information indicating when the FIP settings are going to be used." Prelim. Resp. 8−9 (citing Ex. 1020, 26:20−21, 27:21−22, 28:15−25 (Transcript of the *Markman* hearing in the Delaware case); Ex. 2001, 7[9] (Claim Construction Memorandum Opinion in the Delaware case) ("The parties stated at oral argument that they agree that the specification provides two embodiments, and that the claims read only on the 'flag signal' embodiment, and not the 'message' or 'FEC codeword counter' embodiment.").

At the outset, we do not agree with Patent Owner that "Petitioner (via its RPI and privy, 2Wire)" agreed, at the *Markman* hearing in the Delaware case, that "a flag signal does not include information indicating when the FIP settings are going to be used." *Id.* Petitioner could not have agreed to Patent Owner's proposed claim construction because Petitioner was not a party to the Delaware case. As discussed above, 2Wire is neither an RPI nor a privy of Petitioner. For these reasons, Petitioner could not have agreed

[9] Our citations to Exhibit 2001 refer to the page numbers added by Patent Owner on the bottom, right corner of the page.

with Patent Owner's proposed claim construction at the District Court's *Markman* hearing in the Delaware case.

We also do not agree with Patent Owner that "the District Court agreed[] that a flag signal does not include information indicating when the FIP settings are going to be used." Prelim. Resp. 8. In its Claim Construction Memorandum Opinion, the District Court in the Delaware case, after considering both parties' arguments and evidence, rejected Patent Owner's proposed construction and adopted Defendants' compromise construction, which does not import the negative limitation advanced by Patent Owner into the claims. Ex. 2027, 7−8; *see also* Ex. 1024, 2. The District Court in the Delaware case noted that "the patent does not provide lexicography for 'flag signal,'" and "[Patent Owner] does not argue that a disclaimer supports it[s] construction." Ex. 2027, 7−8.

The '835 patent discloses that "synchronization can be based on, for example, a synchronization using FEC codeword counters or a flag signal." Ex. 1001, 11:7−9. The "flag signal" embodiment does not limit a flag signal to "an inverted sync symbol, or sync FLAG, as used in the ADSL2 G.992.3 OLR protocol," as Patent Owner alleges. The portions of the Specification relied upon by Patent Owner and Dr. Madisetti use permissive language in explaining that "*[f]or example*, the flag signal *could be* an inverted sync symbol, or sync FLAG, as used in the ADSL2 G.992.3 OLR protocol." Ex. 1001, 12:29−31. Moreover, Patent Owner conceded at the *Markman* hearing in the Delaware case that a flag signal may contain information that indicates when updated FIP settings are to be used, as long as the

information contains no FEC codeword counter value. Ex. 1020, 25:6−25 ("[T]heir construction suggests that . . . a flag signal . . . has information in it that tells you when updated FIP settings are to be used."), 26:15−18 ("[T]hey are not requiring the signal to include information and that *it may include*, we would be willing to live with that.").

Based on the claim language and the Specification, we decline to adopt Patent Owner's proposed claim construction because Patent Owner's construction would improperly import a negative limitation from in the Specification into the claims. The Federal Circuit "has repeatedly cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification." *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1346–47 (Fed. Cir. 2015). "[I]t is the *claims*, not the written description, which define the scope of the patent right." *Id*. at 1346 (emphasis in the original). For purposes of this Decision, we adopt Petitioner's proposed construction, which is the District Court's construction in the Delaware case, construing "flag signal" as "signal used to indicate when an update FIP setting is to be used (the signal does not include the FEC codeword counter value upon which the updated FIP setting is to be used)." Pet. 10−11; Ex. 1024, 2.

D. Principles of Law

To establish anticipation, each and every element in a claim, arranged as recited in the claim, must be found in a single prior art reference. *See Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008);

Karsten Mfg. Corp. v. Cleveland Golf Co., 242 F.3d 1376, 1383 (Fed. Cir. 2001). Although the elements must be arranged or combined in the same way as in the claim, "the reference need not satisfy an *ipsissimis verbis* test," i.e., identity of terminology is not required. *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009); *accord In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990). Further, to be anticipating, a prior art reference must be enabling and must describe the claimed invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention. *See Helifix Ltd. v. Blok-Lok, Ltd.*, 208 F.3d 1339, 1346 (Fed. Cir. 2000); *In re Paulsen*, 30 F.3d 1475, 1479 (Fed. Cir. 1994).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, "would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness.[10] *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

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[10] Neither party presents evidence or arguments regarding objective evidence of non-obviousness in the instant proceeding at this time.

E. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quotation marks omitted).

Here, Petitioner asserts that a person of ordinary skill in the art of the '835 patent would have had "a bachelor's degree in electrical or computer engineering, or equivalent, and at least 5−6 years of experience," or alternatively, "a master's degree in electrical or computer engineering, or the equivalent; and at least 2−3 years of experience; or a Ph.D in electrical or computer engineering, or the equivalent, with at least 1−2 years of experience," citing to the Declaration of Krista Jacobsen, Ph.D., for support. Pet. 10 (citing Ex. 1003 ¶ 38).

In addition, Dr. Jacobsen testifies that "as of priority date of the '835 patent, a person having ordinary skill in the art would have been familiar with the relevant standards including T1.413 Issue 1, T1.413 Issue 2, G.992.1, G.992.2, and G.992.3, contributions to the working groups on those standards, and other publication and technology related to DSL systems." Ex. 1003 ¶ 158 (citing Ex. 1007 (American National Standards Institute (ANSI) for Telecommunications – Network and Customer Installation Interfaces – Asymmetric Digital Subscriber Line (ADSL) Metallic Interface, T1.413-1995) (T1.413 Issue 1); Ex. 1008 (T1.413 Issue 2); Ex. 1004

(G.992.1); Ex. 1022 (G.992.2); Ex. 1021(G.992.3)). Indeed, the '835 patent confirms that the ADSL series of the ITU G.992.x standards and the VDSL series of ITU G.993.x standards were known in the art. Ex. 1001, 1:50−54. Wunsch also describes that "[t]he world standards for ADSL are defined in ITU 992.1 and 992.2." Ex. 1006 ¶ 3.

At this juncture, Patent Owner does not proffer any assessment regarding the knowledge of an ordinarily skilled artisan.

For purposes of this Decision, we adopt the level of ordinary skill as articulated by Petitioner because, based on the current record, this proposal appears to be consistent with the '835 patent, prior art of record, and supported by the testimony of Dr. Jacobsen, except that we do not accept the qualifier "at least," which would expand the required amount of experience indefinitely.

F. Overview of the Asserted Prior Art

G.992.1 (Exhibit 1004)

G.992.1 is titled "Series G: Transmission Systems and Media, Digital Systems and Networks, Digital transmission systems – Digital sections and digital line system – Access networks, Asymmetric digital subscriber line (ADSL) transceivers." Ex. 1004, 1. G.992.1 defines the modulation technique used in ADSL (namely, discrete multi-tone ("DMT") modulation), describes how data and overhead bits are organized into frames that are modulated for transmission, defines an initialization protocol, and defines a protocol that transceivers can use to modify their FEC and/or interleaver parameters during steady-state transmission (Showtime). *Id.* §§ 1, 7, 8, 10,

App. II. In particular, G.992.1 discloses a protocol for on-line reconfiguration of FIP settings, in which the transceiver at the network operator end ("ATU-C") sends a DRA_Configuration_Request message to the transceiver at the customer end ("ATU-R"). *Id.* at App. II, II.4.1. After a series of messages through which the ATU-C and ATU-R agree to new parameter values, the ATU-C sends a DRA_Swap_Request message to the ATU-R to instruct the ATU-R when to switch to the reconfigured FIP setting. *Id.* at App. II.6.2. The DRA_Swap_Request message includes a superframe reference number ("SFR"), identifying the value of the superframe counter at which the switch will occur. *Id.* at App. II.6, II.6.2. The ATU-R acknowledges the DRA_Swap_Request message by sending a DRA_Swap_Reply message. *Id.* at App. II.6.

G.992.1 also discloses that "Valid values of SFR are: SFR = 4 x N – 1 where N is an integer number," and that "[i]f the modems operate with the mandatory S-values, these SFR-references always coincide with codeword boundaries," which "avoids an explicit Reset of the FEC-mechanism." *Id.* at App. II.6. Further, "SFR equals zero at the first ShowTime symbol and is then increased by one (modulo 256) at each consecutive superframe." *Id.* The value of S is the number of DMT symbols per FEC codeword. *Id.* § 7.4.1.2.2 ("S = number of DMT symbols per FEC codeword"). The mandatory values of S are provided in Tables 7-7 (downstream) and 8-3 (upstream).

SC-060 (Exhibit 1005)

SC-060 is titled "Protocol for On-Line Reconfiguration of ADSL." Ex. 1005, 1. SC-060 contains discussion and proposed text for the control of On-Line Reconfiguration (OLR) actions based at the physical lay. *Id.* The OLR protocol is used by a transceiver ("ATU") to perform all on-line reconfiguration functions—bit swapping, dynamic rate repartitioning ("DRR"), and seamless rate adaptation ("SRA"). *Id.* § 2, 3.

Figure 2 of SC-060 is reproduced below.

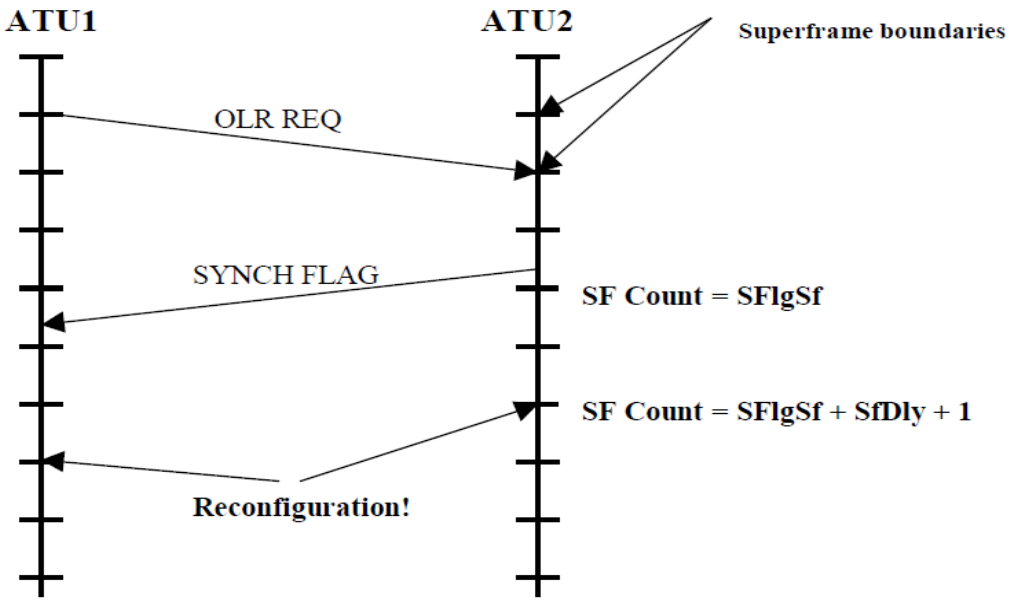

Figure 2: a successful completion of the OLR protocol

Figure 2 of SC-060 above shows the completion of the OLR exchange between two transceivers (ATU1 & ATU2) leading to reconfiguration. *Id.* § 3.5. In the first step, ATU1 sends the OLR Request message with valid SFlgSf and SfDly parameters to ATU2. *Id.* "Synch Flag Superframe (SFlgSf): contains the superframe count (modulo 256) when a valid Synch

Flag (OLR Acknowledgement) can be received." *Id.* § 3.1. "Superframe Delay (SfDly): contains the delay between the OLR Acknowledgement (Synch Flag) and Reconfiguration in superframes." *Id.* Valid range for SfDly "is integer 0 to 3, inclusive." *Id.* "The requested OLR would take place in the first data symbol SfDly superframes after the Synch Flag is sent. (length: 1 octet)." *Id.*

In the second step, after receiving the OLR Request message, ATU2 acknowledges and signals compliance with Synch Flag during the Superframe count specified by SFlgSf in OLR Request message. *Id.* § 3.5. In the third step, ATU2 uses the new parameters for transmission on the first DMT symbol of the Superframe with count equal to (SFlgSf + 1 + SFDly) modulo 256. *Id.* In the fourth step, ATU1 detects Synch flag during the Superframe of count equal to SFlgSf and uses the new parameters for reception on the first DMT symbol of the Superframe with count equal to (SFlgSf + 1 + SFDly) modulo 256. *Id.*

Wunsch (Exhibit 1006)

Wunsch discloses a system and method for robust, flexible reconfiguration of transceiver parameters for communication systems. Ex. 1006, codes (54), (57). Wunsch describes that ADSL applications are an important part of the telecommunications infrastructure, and that the world standards for ADSL are defined in ITU 992.1 and 992.2, at the time of Wunsch's invention. *Id.* ¶ 3.

Wunsch discloses an embodiment that "uses a physical media dependent (PMD) 'Synchronization Flag' or synch flag to specify if and

when to reconfigure in combination with an overhead message that specifies the specific ADSL PMD superframe in which the synch flag will reside, as well as specifying the transceiver parameters of the proposed new configuration." *Id.* ¶ 15. Wunsch discloses a communication system that includes a transmitter and a receiver, transmitting and receiving information over a communication channel. *Id.* ¶ 16. The receiver determines reconfiguration parameters, ack/comply timing information and implementation timing information and provides this information in a reconfiguration request to the transmitter. *Id.* The request in Wunsch includes proposed reconfigured transceiver settings, as well as two additional parameters, Synch Flag superframe identification ("SFlgSf") and a reconfigure implementation delay ("Dly"). Ex. 1006 ¶¶ 51, 55, 57. SFlgSf instructs the second transceiver when to send an acknowledgment back to the first transceiver. *Id.* ¶ 51. Dly instructs the second transceiver how long after sending the acknowledgment it should wait before switching to the reconfigured transceiver settings. *Id.* ¶ 55. The acknowledgment is in the form of a Synch Flag, which "can be readily identified" by the first transceiver. *Id.* ¶ 49. The second transceiver then sends the Synch Flag after counting SFlgSf superframes, with the count starting upon receipt of the request to reconfigure. *Id.* ¶ 51. The second transceiver then switches to the reconfigured transceiver settings for transmission after counting "(SFlgSf + 1 + SfDly) modulo 256" after sending the Synch Flag. *Id.* ¶ 59. The first transceiver looks for the Synch Flag in the specified superframe

and upon detection, counts (SFlgSf+1+SfDly) modulo 256 superframes before switching to the new transceiver settings for reception. *Id.* ¶¶ 68, 69.

G. Anticipation Based on G.992.1

Petitioner asserts that claims 8−10, 15, 24−26, and 31 are unpatentable under § 102(b) as anticipated by G.992.1 (Ground 1). Pet. 18−29. Patent Owner opposes. Prelim. Resp. 35−41. Upon consideration of Petitioner's explanations and supporting evidence in this current record, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in showing that claims 8−10, 15, 24−26, and 31 are unpatentable under § 102(b) as anticipated by G.992.1. In addition, based on the current record, we also find that Petitioner has presented compelling evidence of unpatentability because Petitioner's evidence, if unrebutted at trial, would plainly lead to a conclusion that these claims are unpatentable under § 102(b) as anticipated by G.992.1 by a preponderance of the evidence.

1. Claim 8

Petitioner's showing

Petitioner asserts that G.992.1 discloses every limitation recited in claim 8. Pet. 18−24. In particular, Petitioner argues that, to the extent that the preamble of claim 8 is limiting, G.992.1 discloses "[a]n apparatus configurable to adapt forward error correction and interleaver parameter (FIP) settings during steady-state communication or initialization," as recited in the preamble of claim 8. *Id.* at 18−19. Petitioner explains that G.992.1

discloses a mechanism called dynamic rate adaptation (DRA), which can be executed by the ATU-C and ATU-R and "allows reconfiguration of the modem during Showtime" without "a lengthy restart to reconfigure the modem." *Id.* (citing Ex. 1004, App. II.1). Petitioner also notes that G.992.1 discloses that "[r]ate modification implies more than just bit rate but also FEC and Interleaving settings." *Id.* at 18 (citing Ex. 1004, App. II.1; Ex. 1003 ¶¶ 247−248).

For element 8.a that recites "a transceiver, including a processor," Petitioner argues that each of G.992.1's ATU-C and ATU-R is a transceiver having a processor. *Id.* (citing Ex. 1004 § 5.1.1, Fig. 10-5).

As to element 8.b that recites "transmit a signal using a first FIP setting," Petitioner argues that G.992.1 sets forth minimum required downstream and upstream FEC and interleaving capabilities, i.e., FIP settings, for both ATU-C and ATU-R. *Id.* at 19−20 (citing Ex. 1004 §§ 7.6, 8.6, Tables 7-7, 8-3; Ex. 1003 ¶¶ 122−123).

With respect to element 8.c that recites "transmit a flag signal," Petitioner argues that G.992.1 discloses that ATU-C sends a DRA_Swap_Request message (a flag signal) "to inform the ATU-R about when to swap the rate," which includes changing "FEC and Interleaving settings" (FIP settings). *Id.* at 20 (citing Ex. 1004, App. II.1.1, II.6). According to Petitioner, G.992.1 discloses an SFR included in the message identifying "around which superframe boundary the rate swap will occur." *Id.* (citing Ex. 1004, App. II.6). Dr. Jacobsen testifies that a person of ordinary skill in the art would have understood that the SFR is not a FEC

codeword counter value, and no other item of information in the DRA_Swap_Request message is a FEC codeword counter value. Ex. 1003 ¶ 269.

As to element 8.d that recites "switch to using for transmission, a second FIP setting following transmission of the flag signal," Petitioner argues that the DRA procedure in G.992.1 "allows reconfiguration of the modem during Showtime," including modifications to FIP settings. Pet. 22 (citing Ex. 1004, App. II.1, II.1.1). Petitioner explains that, during Showtime, while using an initial FIP setting, the ATU-C sending the DRA_Swap_Request message, which includes a proposed new FIP setting (the proposed values for parameters including the number of symbols per FEC codeword and the interleave depth in codewords). *Id.* (citing Ex. 1004, App. II.4.1). Petitioner further explains that, when the ATU-R accepts the proposed new settings, the ATU-C then sends the DRA_Swap_Request message (the flag signal), and then, at the superframe boundary specified in the DRA_Swap_Request message, both the ATU-C and ATU-R switch to the new configuration (a second FIP setting). *Id.* (citing Ex. 1004, App. II.6; Ex. 1003 ¶ 288).

For element 8.e that recites "the first FIP setting comprises at least one first FIP value," Petitioner argues that ATU-C and ATU-R in G.992.1 transmit signals using FIP settings, including a FEC parameter value and an interleaver parameter value. *Id.* at 23 (citing Ex. 1004 § 7.6 (specifying values for R (the number of parity bytes per Reed-Solomon codeword) and values of D (interleaver depth)); Ex. 1003 ¶ 292).

With respect to element 8.f that recites "the second FIP setting comprises at least one second FIP value, different than the first FIP value," Petitioner argues that the DRA_Swap_Request message sent by ATU-C includes proposed values for the number of downstream symbols per FEC codeword (S_d), the number of upstream symbols per FEC codeword (S_u), the downstream interleaver depth in codewords (I_d), and the upstream interleaver depth in codewords (I_U), and that these proposed values may be different from their values in the first FIP setting. *Id.* at 23−24 (citing Ex. 1004, App. II.1.1, II.4.1; Ex. 1003 ¶ 295).

In connection with element 8.g that recites "the switching occurs on a pre-defined forward error correction codeword boundary following the flag signal," Petitioner argues that the SFR in the DRA_Swap_Request message sent by ATU-C identifies "around which superframe boundary the rate swap will occur," and that "[i]f the modems operate with the mandatory S-values, these SFR-references *always coincide with codeword boundaries*," which "avoids an explicit Reset of the FEC-mechanism" and would require the switching to occur on a pre-defined FEC codeword boundary. *Id.* at 24 (citing Ex. 1004, App. II.6; Ex. 1003 ¶ 298).

Based on the evidence in this preliminary record, we determine that Petitioner has shown sufficiently, for purposes of instituting a trial, that G.992.1 discloses all of the limitation recited in claim 8. In addition, based on the current record, we also find that Petitioner has presented compelling evidence of unpatentability because Petitioner's evidence, if unrebutted at

trial, would plainly lead to a conclusion that claim 8 is unpatentable under § 102(b) as anticipated by G.992.1 by a preponderance of the evidence.

For the reasons discussed below, we do not find Patent Owner's arguments undermine Petitioner's showing.

Patent Owner's arguments

In its Preliminary Response, Patent Owner advances several arguments. Prelim. Resp. 35−41. First, Patent Owner argues that the DRA_Swap_Request message in G.992.1 is not a flag signal because it does not "indicate when an updated FIP setting *is to be* used" because it is only a request that may be rejected and the DRA_Swap_Reply may include "NACK_SWAP." *Id.* at 36−38 (citing Ex. 1004, 251; Ex. 2028 ¶ 40). According to Patent Owner, Petitioner's declarant, Dr. Jacobsen, previously admitted in the Delaware case that the request may be rejected. *Id.* (citing Ex. 2024[11], 15:19−24 (Cross-examination deposition of Dr. Jacobsen in the Delaware case)).

At the outset, we do not find that Dr. Jacobsen made such an admission. In response to the question "is it your understand that that would be a rejection of the request for a DRA swap?" during cross-examination for the Delaware case, Dr. Jacobsen merely stated that "I'm looking for something that defines what that is; and I don't see it in the state machine for the ATU-R." Ex. 2024, 17:2−7. And in response to the question "do you

[11] Each of the citations to Exhibit 2024 refers to the page number added by Patent Owner in the bottom, right corner of the page.

think it's reasonable to interpret that as indicating that the DRA swap reply can reject the DRA swap it's requested in the DRA swap request message?", Dr. Jacobsen stated that "[t]hat is one interpretation." *Id.* at Ex. 2024, 17:2−18:4.

In any event, Patent Owner's arguments improperly rest on the premise that the DRA_Swap_Request message may be rejected. As the Federal Circuit has held, "a prior art product that sometimes, but not always, embodies a claimed method nonetheless teaches that aspect of the invention." *Hewlett-Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1326 (Fed. Cir. 2003). Here, G.992.1 makes clear that "[o]nce the modems have agreed on the appropriate settings for the new configuration, the swap to the new configuration must be activated and synchronized," and that "[a] swap always refers to the most recently agreed and successfully exchanged rate configuration settings." Ex. 1004, App. II.6. According to G.992.1, when the ATU-C sends DRA_Swap_Request "to inform the ATU-R about when to swap the rate," the "ATU-R will acknowledge this request through the use of DRA_Swap_Reply." *Id.* G.992.1 further discloses that the SFR included in the DRA_Swap_Request message identifies "around which superframe boundary the rate swap will occur." *Id.* Therefore, on this record, we do not find Patent Owner's argument that the DRA_Swap_Request message in G.992.1 does not "indicate when an updated FIP setting *is to be* used" undermines Petitioner's showing. Prelim. Resp. 36−38.

Second, Patent Owner argues that the DRA_Swap_Request message is not a flag signal because "the SFR is necessarily an FEC codeword

counter value given the manner in which Petitioner and its expert apply G.992.1 in order to allege that the 'switching occurs on a pre-defined forward error correction codeword boundary following the flag signal.'" Prelim. Resp. 38−40 (citing Ex. 2028 ¶ 42). According to Patent Owner, "Dr. Jacobsen admitted that the SFR value corresponds to a particular FEC codeword counter value." *Id.* at 40 (citing Ex. 2028 ¶ 42; Ex. 2025[12], 20:1−25, 21:22−24, 30:5−7, 31:11−14, 32:5−12). Patent Owner also argues that "[t]he DRA_Swap_Request message is not a flag signal as properly construed." *Id.* at 41.

Patent Owner's arguments are unavailing because those arguments improperly rely on Patent Owner's proposed claim construction for the term "flag signal." As discussed above in our claim construction analysis in Section II.C, we decline to adopt Patent Owner's construction because Patent Owner's construction would improperly import a negative limitation from in the Specification into the claims—namely, precluding any information specifying when the updated FIP setting is to be used.

In light of the claim language and the Specification, we adopt Petitioner's proposed construction, which is the same as the District Court's construction in the Delaware case—namely, construing "flag signal" as "signal used to indicate when an update FIP setting is to be used (the signal does not include the FEC codeword counter value upon which the updated

[12] Each of our citations to Exhibit 2025 refers to the page number added by Patent Owner in the bottom, right corner of the page.

FIP setting is to be used)." Pet. 10−11; Ex. 1024, 2. To be clear, this construction does not exclude an SFR.

In addition, we are not convinced by Patent Owner's argument that the DRA_Swap_Request message is not a flag signal. Petitioner's evidence in this current record plainly shows that G.992.1 discloses the claimed "flag signal" under the proper construction. Notably, G.992.1 makes clear that the SFR included in the DRA_Swap_Request message identifies "around which superframe boundary the rate swap will occur." Ex. 1004, App. II.6. Moreover, Dr. Jacobsen testifies that the SFR is not a FEC codeword counter value because the superframe counter in G.992.1 counts superframes, not codewords. Ex. 1003 ¶¶ 269, 273. Dr. Jacobsen also testifies that the value of superframe counter is not a proxy of an FEC codeword counter because "the superframe counter does not count each FEC codeword as it is transmitted or received as the FEC codeword counters defined in the '835 patent do," and also "it is not possible to determine based solely on the superframe counter how many FEC codewords have been transmitted or received or what the value of a hypothetical FEC codeword counter would be." *Id.* ¶¶ 273−283.

Furthermore, we do not find that Dr. Jacobsen made an admission that "the SFR value corresponds to a particular FEC codeword counter value" in a prior litigation, as Patent Owner alleges. Prelim. Resp. 40. Patent Owner improperly conflates "value" with "boundary." Notably, Dr. Jacobsen merely stated that "[t]he SFR value is a superframe counter value" and "[i]ts values are limited to ensure that whichever one you pick, it coincides with

an FEC code word *boundary*." Ex. 2025, 30:5−7 (emphasis added). Dr. Jacobsen also stated that "the SFR values are restricted to ensure that whichever one you pick, as long as your value of S is one of the mandatory values, that switch will be on an FEC code word *boundary*." *Id.* at 31:11−14 (emphasis added).

On this record, we are not convinced by Patent Owner's arguments that "the SFR is necessarily an FEC codeword counter" and the DRA_Swap_Request message is not a "flag signal." Prelim. Resp. 38−41.

Based on the evidence in this preliminary record, we determine that Petitioner has shown sufficiently, for purposes of instituting a trial, that G.992.1 discloses all of the limitation recited in claim 8. In light of the foregoing, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in showing that claim 8 is unpatentable under § 102(b) as anticipated by G.992.1. In addition, based on the current record, we also find that Petitioner has presented compelling evidence of unpatentability because Petitioner's evidence, if unrebutted at trial, would plainly lead to a conclusion that these claims are unpatentable under § 102(b) as anticipated by G.992.1 by a preponderance of the evidence.

2. Claims 9−10, 15, 24−26, and 31

Having reviewed Petitioner's arguments and supporting evidence in this present record, we determine that Petitioner has established adequately for purposes of this Decision that G.992.1 discloses the limitations recited in claims 9−10, 15, 24−26, and 31. *See* Pet. 25–29. Accordingly, we determine that Petitioner has demonstrated a reasonable likelihood of

demonstrating that those claims also are unpatentable under § 102(b) as anticipated by G.992.1. In addition, based on the current record, we also find that Petitioner has presented compelling evidence of unpatentability because Petitioner's evidence, if unrebutted at trial, would plainly lead to a conclusion that those claims are unpatentable under § 102(b) as anticipated by G.992.1 by a preponderance of the evidence.

Patent Owner mainly relies on its arguments for claim 8. Prelim. Resp. 35–41. We already addressed those arguments in our analysis above for claim 8, and we find those arguments unavailing here for the reasons stated above.

3. Conclusion on Anticipation Based on G.992.1

Based on the evidence in the present record, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in showing that claims 8–10, 15, 24–26, and 31 are unpatentable under § 102(b) as anticipated by G.992.1. In addition, based on the current record, we also find that Petitioner has presented compelling evidence of unpatentability because Petitioner's evidence, if unrebutted at trial, would plainly lead to a conclusion that these claims are unpatentable under § 102(b) as anticipated by G.992.1 by a preponderance of the evidence.

H. Obviousness over SC-060

Petitioner asserts that claims 8–10, 15, 24–26, and 31 are unpatentable under § 103(a) as obvious over SC-060 (Ground 2). Pet. 29–41. Patent Owner opposes. Prelim. Resp. 41–47. Upon

consideration of Petitioner's explanations and supporting evidence in this current record, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in showing that claims 8−10, 15, 24−26, and 31 are unpatentable under § 103(a) as obvious over SC-060.

1. Claim 8

Petitioner's showing

Petitioner asserts that SC-060 would have rendered claim 8 obvious. Pet. 30−37. In particular, Petitioner argues that, to the extent that the preamble of claim 8 is limiting, SC-060 discloses that ATUs are configurable to perform various form of on-line reconfiguration, and that "the FEC Codeword size could also be modified in SRA transactions," which a person of ordinary skill in the art would have understood to be an FIP setting. *Id.* at 30 (citing Ex. 1005 § 2.1; Ex. 1003 ¶ 347). Petitioner also argues that SC-060 discloses modifying PMS-TC parameters, which a relevant artisan would have understood that include FEC parameters and interleaver parameters. *Id.* (citing Ex. 1005 § 2.1; Ex. 1003 ¶ 348). Petitioner avers that, although SC-060 does not expressly list any FIP settings as PMS-TC parameters "that may be modified as a result of an OLR," it would have been obvious to a relevant artisan to extend the protocol to also modify these parameters. *Id.* at 30−31 (citing Ex. 1003 ¶ 348).

For element 8.a that recites "a transceiver, including a processor," Petitioner argues that SC-060 discloses ATU-C and ATU-R transceivers. *Id.* at 31 (citing Ex. 1005 § 3).

As to element 8.b that recites "transmit a signal using a first FIP setting," Petitioner argues that SC-060 discloses that ATU-C and ATU-R transmit and receive signals, and that a relevant artisan would have understood that those transceivers would have transmit signals using both FEC and interleaver parameter settings according to the DSL standards at the time of the invention. *Id.* at 32 (citing Ex. 1005 § 3; Ex. 1003 ¶ 361).

With respect to element 8.c that recites "transmit a flag signal," Petitioner argues that SC-060 discloses an on-line reconfiguration protocol for changing a number of different transceiver settings and using a Synch Flag to "indicate when an updated" transceiver setting is to be used. *Id.* at 32−33 (citing Ex. 1005 §§ 2.3, 3.3). According to Petitioner, SC-060 discloses that the Synch Flag replaces a Synch Symbol in the superframe and that the "[a] Synch Flag is the inverse of the Synch Symbol," which is an example "flag signal" specifically recited in the '835 patent. *Id.* at 33 (citing Ex. 1005 § 3.3; Ex. 1001, 12:29−31).

As to element 8.d that recites "switch to using for transmission, a second FIP setting following transmission of the flag signal," Petitioner argues that SC-060 discloses that the switch to updated transceiver settings occurs following transmission of the flag signal at a predetermined time following the transmission of the flag signal. *Id.* (citing Ex. 1005 § 3.5, Fig. 2 (reproduced in Section II.F above)).

For element 8.e that recites "the first FIP setting comprises at least one first FIP value," Petitioner argues that a relevant artisan would have understood that ATU-C and ATU-R to transmit and receive signals

containing FIP settings, which would include at least one first FIP value. *Id.* at 34 (citing Ex. 1003 ¶ 378).

With respect to element 8.f that recites "the second FIP setting comprises at least one second FIP value, different than the first FIP value," Petitioner argues that Petitioner argues that it would have been obvious to use the OLR protocol to reconfigure FIP settings and that, following the reconfiguration, at least one FIP value, "such as the number of payload bytes per FEC codeword (K), the number of redundancy bytes per FEC codeword (R), the FEC codeword size (N), or the interleaver depth (D), would have a different value than the first value prior to the OLR." *Id.* at 35 (citing Ex. 1003 ¶ 380).

In connection with element 8.g that recites "the switching occurs on a pre-defined forward error correction codeword boundary following the flag signal," Petitioner argues SC-060 describes the timing for the transceivers to implement the new configuration after the transmitting transceiver sends the Synch Flag. *Id.* at 35−36 (citing Ex. 1005 §§ 3.4, 3.5, Fig. 1). Petitioner contends that a relevant artisan would have recognized that "it is necessary to set the reconfiguration to always occur on a FEC codeword boundary to avoid a reset of the FEC mechanism." *Id.* at 36 (citing Ex. 1003 ¶ 384).

Based on the evidence in this preliminary record, we determine that Petitioner has shown sufficiently, for purposes of instituting a trial, that SC-060 would have rendered claim 8 obvious.

Patent Owner's arguments

Patent Owner argues that SC-060 does not disclose adapting FIP settings. Prelim. Resp. 41−43. Patent Owner also contends that SC-060's Synch Flag does not disclose the claimed "flag signal" because SC-060 does not disclose updating FIP settings and SC-060's Synch Flag is not a "signal used to indicate when an updated FIP setting is to be used." *Id.* at 42−43. Patent Owner further avers that SC-060 does not render the challenged claims obvious because (1) Petitioner has not articulated any valid reason why a person of ordinary skill in the art would have been motivated to modify SC-060 to adapt FIP settings, and (2) Petitioner has not established that there would be a reasonable expectation of success. *Id.* at 43−47.

Based on this preliminary record, Patent Owner's arguments are unavailing. SC-060 discloses a unified OLR protocol for ADSL, and explains that "[t]he term On-Line Reconfiguration (OLR) is a general term used to encompass a number of specific PMD and PMS-TC reconfigurations." Ex. 1005 §§ 2.1, 5. SC-060 also describes three applications for OLR—namely, bit swapping, DDR, and SRA, and that "[o]bviously these three applications of On-Line Reconfiguration have many parameters in common and therefore it makes sense to combine them into a single OLR protocol." *Id.* SC-060 further discloses that ATUs are configurable to perform various types of on-line reconfiguration, including modifying "[t]he number of bearer octets per Mux Data Frame and the FEC codeword size" and "PMD, PMS-TC, and TPS-TC parameters." *Id.* §§ 2.1, 2.3.

Dr. Jacobsen testifies that SC-060 discloses that "the FEC Codeword size could also be modified in SRA transactions," and that a relevant artisan would have understood that the FEC codeword size is an FIP setting. Ex. 1003 ¶ 347 (citing Ex. 1005 § 2.1). Dr. Jacobsen also testifies that SC-060 discloses modifying PMS-TC parameters, and that a relevant artisan would have understood that "PMS-TC parameters include FEC parameters and interleaver parameters." *Id.* ¶ 348 (citing Ex. 1005 § 2.1; Ex. 1021 § 5.1 ("The PMS-TC layer contains the framing and frame synchronization functions, as well as forward error correction, error detection, scramble and descrambler functions."); § 7 (entitled "Physical Media Specific Transmission Convergence (PMS-TC) function" and including subsection 7.7.1.5, entitled "Interleaver" and indicating the interleaver is characterized by, among other things, an interleaver depth D)). Dr. Jacobsen further testifies that a relevant artisan would have used the protocol of SC-060 to modify PMS-TC parameters such as those described in G.992.3. *Id.* (citing Ex. 1021 § 7.5 (listing, among PMS-TC parameters, "number of RS redundancy octets per codeword" and interleaving depth)). As the '835 patent acknowledges in the Background section, "[i]mpulse noise protection is defined in the ADSL2 Standard G.992.3," and "[i]n general, DSL systems (such as the one defined in ADSL G.992.x or VDSL G.993.x) use the FEC and Interleaving Parameters (FIP) characterized by the set of parameters (N, K, R, D)." Ex. 1001, 1:65−66, 2:22−25.

Moreover, Dr. Jacobsen testifies that a relevant artisan would have extended the SC-060 protocol to cover reconfiguration of FEC and

interleaver parameter settings. Ex. 1003 ¶ 351. Dr. Jacobsen testifies that such an artisan would have been familiar with the ADSL standards at the time of SC-060, including G.992.1, and would have understood that G.992.1 includes an optional DRA procedure which provides for the reconfiguration of specific PMS-TC parameters—namely, the number of parity bytes per symbol in the downstream fast buffer (R_{fd}); the number of parity bytes per symbol in the downstream interleave buffer (R_{id}); the number of parity bytes per symbol in the upstream fast buffer (R_{fu}); the number of parity bytes per symbol in the upstream interleave buffer (R_{iu}); the number of downstream symbols per FEC codeword (S_d); the number of upstream symbols per FEC codeword (S_u); the downstream interleave depth in codewords (I_d); and the upstream interleave depth in codewords (I_u). *Id.* ¶ 349.

In light of foregoing, we are not convinced by Patent Owner's argument that SC-060's Synch Flag does not disclose the claimed "flag signal" because SC-060 does not disclose updating FIP settings and SC-060's Synch Flag is not a "signal used to indicate when an updated FIP setting is to be used." Prelim. Resp. 43.

We also are not convinced by Patent Owner's argument that Petitioner has not articulated any valid reason why a person of ordinary skill in the art would have been motivated to modify SC-060 to adapt FIP settings. *Id.* at 43−44. Dr. Jacobsen testifies that a relevant artisan would have been motivated "to increase the reliability and robustness of the G.992.1 protocol to reconfigure its PMS-TC parameters (namely, R_{fd} ,R_{id}, R_{fu}, R_{iu}, S_d, S_u, I_d, and I_u) in the same manner that SC-060 expressly discloses improving the

reliability and robustness of reconfiguration of other PMS-TC parameters." Ex. 1003 ¶ 350. Indeed, SC-060 discloses that "[p]rogrammable timers are used in the proposed protocol for OLR to achieve increased robustness and maximum flexibility in handling the wide variety of potential OLR applications," and that the OLR protocol "[p]rovides extensive robustness to prevent scenarios where only one ATU is initiating a reconfiguration." *Id.* at Abstract, §§ 1, 3.6 (listing benefits of using the OLR protocol, including "significantly decreases the probability of false detections"), 5.

In addition, we are not convinced by Patent Owner's argument that Petitioner has not established that there would be a reasonable expectation of success. Prelim. Resp. 44–47. Dr. Jacobsen testifies that a relevant artisan, who would have been familiar with G.992.1, would have understood that "it would be necessary for the first PMD symbol of the PMD superframe count equal to (SFlgSf + 1 + SfDly) modulo 256 to coincide with an FEC codeword boundary in order to avoid a reset of the FEC mechanism, as G.992.1 discloses." Ex. 1003 ¶ 384; *see also* Ex. 1004, App. II.6. Dr. Jacobsen also testifies that "the transmitter always knows the locations of the FEC codeword boundaries and is configurable to switch from a first FIP setting to a second FIP setting on any of these known boundaries." Ex. 1003 ¶ 385. Moreover, Dr. Jacobsen testifies that "the beginning of a superframe only aligns with an FEC codeword boundary after every four superframes, which is the reason Appendix II of G.992.1 specifies that 'Valid values of SFR are: SFR = 4 x N – 1 where N is an integer number,'" and that "[t]his restriction guarantees that for any one of the mandatory S

values, the selected SFR value will always coincide with an FEC codeword boundary, thus allowing the transition to be seamless with respect to the FEC encoder and decoder." *Id.* ¶ 280 (citing Ex. 1004, App. II.6); *see also id.* ¶ 138.

Indeed, as discussed above, G.992.1 discloses that the SFR included in the DRA_Swap_Request message identifies "around which superframe boundary the rate swap will occur," and that "[v]alid values of SFR are: SFR = 4 x N – 1 where N is an integer number." Ex. 1004, App. II.6. G.992.1 also discloses that "[i]f the modems operate with the mandatory S-values, these SFR-references always coincide with codeword boundaries," which "avoids an explicit Reset of the FEC-mechanism." *Id.* G.992.1 further explains that "SFR equals zero at the first ShowTime symbol and is then increased by one (modulo 256) at each consecutive superframe." *Id.*

Having reviewed the parties' arguments and supporting evidence in this present record, we determine that Petitioner has established adequately for purposes of this Decision that SC-060 teaches or suggests the limitations of claim 8. Accordingly, we find that Petitioner has demonstrated a reasonable likelihood of prevailing in showing that claim 8 is unpatentable under § 103(a) as obvious over SC-060.

2. Claims 9−10, 15, 24−26, and 31

Having reviewed Petitioner's arguments and supporting evidence in this present record, we determine that Petitioner has demonstrated a reasonable likelihood of demonstrating that claims 9−10, 15, 24−26, and 31 are unpatentable under § 103(a) as obvious over SC-060. Patent Owner

relies on similar arguments as those arguments for claim 8. Prelim. Resp. 41–47. We already addressed those arguments in our analysis above for claim 8, and we find those arguments unavailing here for the reasons stated above.

3. Conclusion on Obviousness over SC-060

For the foregoing reasons, we determine that Petitioner has established a reasonable likelihood of prevailing on its assertion that claims 8–10, 15, 24–26, and 31 are unpatentable under § 103(a) as obvious over SC-060.

I. Obviousness over G.992.1 and SC-060

Petitioner asserts that claims 8–10, 15, 24–26, and 31 are unpatentable under § 103(a) as obvious over G.992.1 and SC-060 (Ground 3). Pet. 41–50. Patent Owner opposes. Prelim. Resp. 48–51. Upon consideration of Petitioner's explanations and supporting evidence in this current record, we are persuaded that Petitioner has shown a reasonable likelihood of prevailing in showing that claims 8–10, 15, 24–26, and 31 are unpatentable under § 103(a) as obvious over G.992.1 and SC-060.

1. Claim 8

Petitioner's showing

Petitioner relies upon its explanations and evidence for Grounds 1 and 2 as to how the combination of G.992.1 and SC-060 teaches all of the limitations recited in claim 8. Pet. 41–50. In addition, as to the "flag signal" limitations, Petitioner argues that a person of ordinary skill in the art

would have modified the DRA protocol of G.992.1 by replacing the SFR in the DRA_Swap_Request message with the SFlgSf and SfDly parameters of SC-060 and by having the ATU-R provide the acknowledgement of the proposed timing of the switch by transmitting a Synch Flag. *Id.* at 41−43, 45 (citing Ex. 1003 ¶ 457). Dr. Jacobsen testifies that "using the Synch Flag as the acknowledgment, as taught by SC-060, would eliminate the need for the ATU-R to transmit the DRA_Swap_Reply message five times, and for the ATU-C to receive and decode that message correctly three times in a period spanning five messages." Ex. 1003 ¶ 432. Dr. Jacobsen also testifies that a relevant artisan would have "restricted the values of SFlgSf and SfDly to ensure that the switch to the reconfigured settings always occurs on an FEC codeword boundary to avoid a reset of the FEC mechanism, as disclosed by G.992.1." *Id.* ¶ 471 (citing Ex. 1004, App. II.6).

Based on the evidence in this preliminary record, we determine that Petitioner has shown sufficiently, for purposes of instituting a trial, that G.992.1 in combination with SC-060 would have rendered claim 8 obvious.

Patent Owner's arguments

Patent Owner argues that neither G.992.1 nor SC-060 discloses the "flag signal" limitations, relying on its arguments for Grounds 1 and 2. Prelim. Resp. 51. Patent Owner also argues that Petitioner fails to show that there is a reasonable expectation of success at arriving at the claim inventions including the "switching occurs on a pre-defined forward error correction boundary following the flag signal" limitation. *Id.* at 52−53.

Patent Owner's arguments are unavailing. We already have addressed Patent Owner's arguments regarding the claimed "flag signal" for Grounds 1 and 2 in our analysis above, and we find those arguments unavailing here for the reasons stated above.

We also are not convinced by Patent Owner's reasonable expectation of success argument. Dr. Jacobsen testifies that SC-060 proposes a unified protocol for multiple types of on-line reconfiguration, and that this "protocol is fast and efficient requiring only the transmission of one message and one Synch Flag for successful completion." Ex. 1003 ¶ 428 (citing SC-060 § 2.1). Dr. Jacobsen also testifies that SC-060 explains that using SFlgSF to schedule the OLR Acknowledgement has two advantages—namely, that it "provides a much more robust means of acknowledging an OLR Request" by scheduling when the acknowledgment will be sent, and it "reduces the computational load on the requesting ATU" because the requesting ATU only has to look for the Synch Flag in the designated superframe rather than searching for a Synch Flag in every superframe. *Id.* ¶ 430 (citing Ex. 1005 § 3.6). Dr. Jacobsen further testifies that a relevant artisan would have been motivated to use the Synch Flag as the acknowledgment as taught by SC-060 because it "would eliminate the need for the ATU-R to transmit the DRA_Swap_Reply message five times, and for the ATU-C to receive and decode that message correctly three times in a period spanning five messages." *Id.* ¶ 432. Moreover, Dr. Jacobsen testifies that "[t]he two transceivers would then switch to the new FIP values on the first DMT symbol of the superframe with a count equal to (SFlgSf + 1 + SfDly)

modulo 256, which with the mandatory values of S, would always be on a pre-defined FEC codeword boundary to avoid having to reset the FEC mechanism, as disclosed by G.922.1." *Id.* ¶ 436. As discussed above in Ground 1, G.992.1 discloses that "[i]f the modems operate with the mandatory S-values, these SFR-references always coincide with codeword boundaries," which "avoids an explicit Reset of the FEC-mechanism." Ex. 1004, App. II.6.

Having reviewed the parties' arguments and supporting evidence in this record, we determine that Petitioner has established adequately for purposes of this Decision that G.992.1 in view of SC-060 teaches or suggests all of the limitations of claim 8. Accordingly, we find that Petitioner has demonstrated a reasonable likelihood of prevailing in showing that claim 8 is unpatentable under § 103(a) as obvious over G.992.1 and SC-060.

2. Claims 9−10, 15, 24−26, and 31

Having reviewed Petitioner's arguments and supporting evidence in this present record, we determine that Petitioner has demonstrated a reasonable likelihood of demonstrating that claims 9−10, 15, 24−26, and 31 are unpatentable under § 103(a) as obvious over G.992.1 and SC-060. Patent Owner relies on similar arguments as those for claim 8. Prelim. Resp. 48−50. We already addressed those arguments in our analysis above for claim 8, and we find those arguments unavailing here for the reasons stated above.

3. Conclusion on Obviousness over G.992.1 and SC-060

For the foregoing reasons, we determine that Petitioner has established a reasonable likelihood of prevailing on its assertion that claims 8−10, 15, 24−26, and 31 are unpatentable under § 103(a) as obvious over G.992.1 and SC-060.

J. Obviousness over G.992.1 and Wunsch

Petitioner asserts that claims 8−10, 15, 24−26, and 31 are unpatentable under § 103(a) as obvious over G.992.1 and Wunsch (Ground 4). Pet. 50−59. Patent Owner opposes. Prelim. Resp. 51−53. Upon consideration of Petitioner's explanations and supporting evidence in this current record, we are persuaded that Petitioner has shown a reasonable likelihood of prevailing in showing that claims 8−10, 15, 24−26, and 31 are unpatentable under § 103(a) as obvious over G.992.1 and Wunsch.

1. Claim 8

Petitioner's showing

For Ground 4, Petitioner relies upon its explanations and evidence for Ground 1 as to how G.992.1 teaches all of the limitations recited in claim 8, except for the claimed "flag signal." Pet. 50−59. For the "flag signal" limitations, Petitioner notes that Wunsch discloses a first transceiver sends a request to reconfigure transceiver parameters to a second transceiver. *Id.* at 50−52 (citing Ex. 1006 ¶ 57, Fig. 4). The request includes proposed reconfigured transceiver settings, as well as two additional parameters, Synch Flag superframe identification ("SFlgSf") and a reconfigure

implementation delay ("Dly"). Ex. 1006 ¶¶ 51, 55, 57. SFlgSf instructs the second transceiver when to send an acknowledgment back to the first transceiver. *Id.* ¶ 51. Dly instructs the second transceiver how long after sending the acknowledgment it should wait before switching to the reconfigured transceiver settings. *Id.* ¶ 55. The acknowledgment is in the form of a Synch Flag, which "can be readily identified" by the first transceiver. *Id.* ¶ 49. The second transceiver then sends the Synch Flag after counting SFlgSf superframes, with the count starting upon receipt of the request to reconfigure. *Id.* ¶ 51. The second transceiver then switches to the reconfigured transceiver settings for transmission after counting (SFlgSf + 1 + SfDly) modulo 256 after sending the Synch Flag. *Id.* ¶ 59. The first transceiver looks for the Synch Flag in the specified superframe and upon detection, counts (SFlgSf+1+SfDly) modulo 256 superframes before switching to the new transceiver settings for reception. *Id.* ¶¶ 68, 69.

Petitioner argues that a person of ordinary skill in the art would have modified the DRA protocol of G.992.1 by replacing the SFR in the DRA_Swap_Request message with the SFlgSf and Dly parameters in light of Wunsch and by having the ATU-R send a synch flag to acknowledge the swap request. Pet. 50−53 (citing Ex. 1003 ¶ 558). Dr. Jacobsen testifies that in light of the teachings of Wunsch, one of ordinary skill in the art would have been motivated "to improve the robustness and preciseness of the DRA protocol of G.992.1 by using the Synch Flag, sent over the PMD layer, as the acknowledgement of the reconfiguration as taught by Wunsch," "eliminat[ing] the need for the ATU-R to transmit the DRA_Swap_Reply

message five times, and for the ATU-C to receive and decode that message correctly three times in a period spanning five messages." Ex. 1003 ¶¶ 527−530.

Based on the evidence in this preliminary record, we determine that Petitioner has shown sufficiently, for purposes of instituting a trial, that G.992.1 and Wunsch would have rendered claim 8 obvious.

Patent Owner's arguments

Patent Owner advances several arguments. First, Patent Owner argues that the disclosure of Wunsch is materially the same as SC-060, and Petitioner applies Wunsch to modify G.992.1 in the same way SC-060 is used to modify G.992.1 in Ground 3. Prelim. Resp. 51−53. Patent Owner contends that "because Ground 4 is materially the same as Ground 3, [Patent Owner's] arguments with respect [to] Ground 3 apply equally to Ground 4." *Id.*

We already addressed those arguments in our analysis above with respect to Ground 3, and we find those arguments unavailing here for the reasons stated above.

Second, Patent Owner argues that the Synch Flag disclosed in Wunsch is not "used to indicate when an updated FIP setting is to be used." Prelim. Resp. 52. However, Patent Owner's argument improperly attacks Wunsch individually. Petitioner's asserted ground of unpatentability is based on a combination of G.992.1 and Wunsch. The test for obviousness is whether the references, taken as a whole, would have suggested the claimed subject matter to a person of ordinary skill in the art at the time the invention

was made. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986); *In re Keller*, 642 F.2d 413, 426 (CCPA 1981) (noting that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references).

Here, Petitioner asserts that one of ordinary skill in the art would have modify the DRQ protocol of G.992.1 by replacing the SFR parameter in the DRA_Swap_Request message with the SFlgSF and Dly parameters of Wunsch. Pet. 50−54. Petitioner also contends that such an artisan would have the ATU-R send a synch flag over the PMD layer, as taught by Wunsch, to acknowledge the swap request. *Id.* According to Petitioner, in the revised protocol, the synch flag, sent by the ATU-R, would be used to indicate to the ATU-C when to use the updated FIP settings. *Id.*

Third, Patent Owner argues that "neither the Petition nor Dr. Jacobsen articulates how a [person of ordinary skill in the art] would, or even could, have used the teachings of G.992.1 to 'restrict the values of SFlgSF and Dly.'" Prelim. Resp. 52−53.

Patent Owner's argument is unavailing. Petitioner explains that "[a]s taught by G.992.1, a [person of ordinary skill in the art] would also restrict the value of SFlgSF and Dly to ensure that the switch to the reconfigured settings always occur on a FEC codeword boundary to avoid a FEC reset." Pet. 55 (citing Ex. 1004, App. II.6; Ex. 1003 ¶ 572). Petitioner also asserts that "[i]n the revised protocol, the ATU-R would switch to using the new FIP settings for transmission after counting (SFlgSf + 1 + Dly) modulo 256 after sending the ack/comply message with the synch flag and the switch

would occur on a FEC codeword boundary defined by the ATU-C." *Id.* at 55−56 (citing Ex. 1003 ¶ 573).

Dr. Jacobsen testifies that a relevant artisan would have been motivated to modify the on-line reconfiguration protocol of G.992.1 by (a) replacing the SFR value in the DRA_Swap_Request message with SFlgSf and Dly parameters of Wunsch, (b) the ATU-R providing the acknowledgment of the proposed timing of the switching by transmitting a Synch Flag, sent over the PMD layer, in the superframe corresponding to SFlgSf, as taught by Wunsch, and (c) the transceivers both switching to the new configuration after (SFlgSf + 1 + Dly) modulo 256 superframes, as taught by Wunsch. Ex. 1003 ¶ 572. Dr. Jacobsen further testifies that a "person having ordinary skill in the art would also restrict the values of SFlgSf and Dly to ensure that the switch to the reconfigured settings always occurs on an FEC codeword boundary to avoid a reset of the FEC mechanism, as taught by G.992.1." *Id.* (citing Ex. 1004, App. II.6).

In addition, Dr. Jacobsen testifies that "the beginning of a superframe only aligns with an FEC codeword boundary after every four superframes, which is the reason Appendix II of G.992.1 specifies that "Valid values of SFR are: SFR = 4 x N – 1 where N is an integer number," and that "[t]his restriction guarantees that for any one of the mandatory S values, the selected SFR value will always coincide with an FEC codeword boundary, thus allowing the transition to be seamless with respect to the FEC encoder and decoder." *Id.* ¶ 280 (citing Ex. 1004, App. II.6); *see also id.* ¶ 138.

Indeed, as discussed above, G.992.1 discloses that the SFR included in the DRA_Swap_Request message identifies "around which superframe boundary the rate swap will occur," and that "[v]alid values of SFR are: SFR = 4 x N – 1 where N is an integer number." Ex. 1004, App. II.6. G.992.1 also discloses that "[i]f the modems operate with the mandatory S-values, these SFR-references always coincide with codeword boundaries," which "avoids an explicit Reset of the FEC-mechanism." *Id.* G.992.1 further explains that "SFR equals zero at the first ShowTime symbol and is then increased by one (modulo 256) at each consecutive superframe." *Id.*

Based on the evidence in this current record, we are not convinced by Patent Owner's argument that "neither the Petition nor Dr. Jacobsen articulates how a [person of ordinary skill in the art] would, or even could, have used the teachings of G.992.1 to 'restrict the values of SFlgSF and Dly.'" Prelim. Resp. 56.

Finally, Patent Owner argues that the Petition advances inconsistent arguments. Prelim. Resp. 53. According to Patent Owner, "the Petition contends that where G.992.1 is modified by Wunsch, the 'ATU-C and ATU-R would switch to the new parameter values at the time specified by the Dly value,'" and "[e]lsewhere, the Petition asserts that 'the ATU-R would switch to using the new FIP settings for transmission after counting (SFlgSf + 1 + Dly) modulo 256 after sending the Synch Flag.'" *Id.*

Patent Owner's argument is unavailing. The sentence regarding "switch[ing] to the new parameter values at the time specified by the Dly value" appears in the last sentence for the "Motivation to Combine G.992.1

and Wunsch" section, summarizing Petitioner's analysis on the timing of the switch. Pet. 51. Petitioner, in its analysis, makes clear that "Dly instructs the second transceiver how long after sending the acknowledgement it should wait before switching to the reconfigured transceiver settings." *Id.* at 49 (citing Ex. 1006 ¶ 55 (disclosing that "the implementation timing information is provided as a delay parameter (Dly)," which "indicates when the transmitter 310, as well as receiver 340, is to implement the new reconfiguration transceiver[r] parameters" and that "the delay provides the number of superframes to be transmitted between the time the ack/comply is sent and the reconfiguration is implemented.")).

Petitioner also clearly explains that "[t]he acknowledgment is in the form of a Synch Flag, which 'can be readily identified' by the first transceiver," and "[t]he second transceiver then sends the Synch Flag after counting SFlgSf superframes, with the count starting upon receipt of the request to reconfigure." *Id.* at 49–50 (citing Ex. 1006 ¶¶ 49, 51). In addition, Petitioner explains that "[t]he second transceiver then switches to the reconfigured transceiver settings for transmission after counting (SFlgSf + 1 + SfDly) modulo 256 after sending the Synch Flag," and "[t]he first transceiver looks for the Synch Flag in the specified superframe and upon detection, counts (SFlgSf + 1 + SfDly) modulo 256 superframes before switching to the new transceiver settings for reception." *Id.* (citing Ex. 1006 ¶¶ 59, 68, 69). Petitioner analysis is consistent with the disclosure of Wunsch. For these reasons, we are not convinced by Patent Owner's

argument that the Petition advances inconsistent arguments. Prelim. Resp. 53.

Having reviewed the parties' arguments and supporting evidence in this record, we determine that Petitioner has established adequately for purposes of this Decision that G.992.1 in view of Wunsch teaches or suggests all of the limitations of claim 8. Accordingly, we find that Petitioner has demonstrated a reasonable likelihood of prevailing in showing that claim 8 is unpatentable under § 103(a) as obvious over G.992.1 in view of Wunsch.

2. Claims 9−10, 15, 24−26, and 31

Having reviewed Petitioner's arguments and supporting evidence in this present record, we determine that Petitioner has demonstrated a reasonable likelihood of demonstrating that claims 9−10, 15, 24−26, and 31 are unpatentable under § 103(a) as obvious over G.992.1 and Wunsch. Pet. 56−59. Patent Owner relies on similar arguments as those for claim 8. Prelim. Resp. 51−53. We already addressed those arguments in our analysis above for claim 8, and we find those arguments unavailing here for the reasons stated above.

3. Conclusion on Obviousness over G.992.1 and Wunsch

For the foregoing reasons, we determine that Petitioner has established a reasonable likelihood of prevailing on its assertion that claims 8−10, 15, 24−26, and 31 are unpatentable under § 103(a) as obvious over G.992.1 and Wunsch.

III. CONCLUSION

For the foregoing reasons, we determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail with respect to challenged claims 8−10, 15, 24−26, and 31 of the '835 patent. In addition, based on the evidence in this record, we find that Petitioner presents compelling evidence of unpatentability as to the anticipation ground based on G.992.1, and therefore, we decline to exercise our discretion to deny institution under *Fintiv*. At this juncture in the proceeding, we have not made a final determination with respect to the patentability of the challenged claims, or with respect to claim construction.

IV. ORDER

For the foregoing reasons, it is

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted for the following asserted grounds:

Claims Challenged	**35 U.S.C. §**	**References**
8−10, 15, 24−26, 31	102(b)	G.992.1
8−10, 15, 24−26, 31	103(a)	SC-060
8−10, 15, 24−26, 31	103(a)	G.992.1, SC-060
8−10, 15, 24−26, 31	103(a)	G.992.1, Wunsch

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this Decision.

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